238596

Fwd: Cayuga County Groundwater Contamination Site
Kevin Farrar
to:
Pietro Mannino, Isabel Rodrigues, Harry Warner, Jess LaClair, Kevin Kelly, Michael Ryan, William Daigle, jhd01
06/25/2012 12:08 PM
Hide Details
From: "Kevin Farrar" <kxfarrar@gw.dec.state.ny.us> Sort List...

To: Pietro Mannino/R2/USEPA/US@EPA, Isabel Rodrigues/R2/USEPA/US@EPA, "Harry Warner" <hdwarner@gw.dec.state.ny.us>, "Jess LaClair" <jalaclai@gw.dec.state.ny.us>, "Kevin Kelly" <kjkelly@gw.dec.state.ny.us>, "Michael Ryan" <mjryan@gw.dec.state.ny.us>, "William Daigle" <wldaigle@gw.dec.state.ny.us>, <jhd01@health.state.ny.us>

History: This message has been replied to and forwarded.

1 Attachment

Cayuga_Proposed Plan comments.docx

Hello, Pete and Isabel;

The attached RLSO file contains the compiled State comments on EPA's Proposed Plan for the EPA Cayuga County Groundwater site.

The Regional staff wanted me to also point out, as an editorial note, that nearly all of the GE Auburn / Powerex site is in the Town of Aurelius. The Auburn City boundary does cut across the property, but only a small portion of the property is in Auburn.

Please have a look at the comments and let me know if you think we should have a phone call to discuss.

Thanks,
Kevin Farrar
Remedial Bureau D / Section A
Division of Environmental Remediation
NYSDEC
625 Broadway, 12th Floor
Albany, NY 12233-7013
518-402-9778

Cayuga County Groundwater Contamination Superfund Site
Cayuga County, New York

July 2012

EPA ANNOUNCES PROPOSED PLAN

This Proposed Plan describes the remedial alternatives considered for the contaminated groundwater at the Cayuga County Groundwater Contamination Superfund site (the Site) and identifies the preferred remedy with the rationale for this preference. This Proposed Plan was developed by the U.S. Environmental Protection Agency (EPA), the lead agency for the Site, in consultation with the New York State Department of Environmental Conservation (NYSDEC). EPA is issuing this Proposed Plan as part of its public participation responsibilities under Section 117(a) of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980, as amended, and Sections 300.430(f) and 300.435(c) of the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). The nature and extent of the contamination at the Site and the remedial alternatives summarized in this Proposed Plan are described in the final Remedial Investigation (RI) Report and the Feasibility Study (FS) Report, both issued in 2012, as well as other documents contained in the Administrative Record for this site. EPA and NYSDEC encourage the public to review these documents to gain a more comprehensive understanding of the Site and the Superfund activities that have been conducted.

This Proposed Plan is being provided as a supplement to the above-noted documents to inform the public of EPA and NYSDEC's preferred remedy and to solicit public comments pertaining to all of the remedial alternatives evaluated, including the preferred alternative. EPA and NYSDEC's preferred alternative involves the in-situ treatment of contaminated groundwater by biological and abiotic remediation and monitored natural attenuation.

The remedy described in this Proposed Plan is the preferred remedy for the Site. Changes to the preferred remedy, or a change from the preferred remedy to another remedial alternative, may be made if public comments or additional data indicate that such a change will result in a more appropriate remedial action. The final decision regarding the selected remedy will be made after EPA has taken into consideration all public comments. EPA is soliciting public comment on all of the alternatives considered in the Proposed Plan and in the detailed analysis section of the FS report, since EPA and NYSDEC may select a remedy other than the preferred alternative.

MARK YOUR CALENDAR

PUBLIC COMMENT PERIOD:
July13, 2012 – August 13, 2012
EPA will accept written comments on the Proposed Plan during the public comment period.

PUBLIC MEETING: July 26, 2012 at 7:00 pm
EPA will hold a public meeting to explain the Proposed Plan and all of the alternatives presented in the Feasibility Study. Oral and written comments will also be accepted at the meeting. The meeting will be held at the Union Springs High School, Union Springs, NY.

COMMUNITY ROLE IN SELECTION PROCESS

EPA and NYSDEC rely on public input to ensure that the concerns of the community are considered in selecting an effective remedy for each Superfund site. To this end, the RI and FS reports and this Proposed Plan have been made available to the public for a public comment period which begins on July13, 2012 and concludes on August 13, 2012.

Comment [NYS1]: When will these be released for public review? Should be prior to the proposed plan.

A public meeting will be held during the public comment period at the Union Springs High School on July 26, 2012 at 7:00 p.m. to present the conclusions of the RI/FS, to elaborate further on the reasons for recommending the preferred alternative, and to receive public comments.

Comments received at the public meeting, as well as written comments, will be documented in the Responsiveness Summary Section of the Record of Decision (ROD), the document which formalizes the selection of the remedy.

Written comments on the Proposed Plan should be addressed to:

Isabel R. Rodrigues
Remedial Project Manager
Western New York Remediation Section
U.S. Environmental Protection Agency
290 Broadway, 20th Floor
New York, New York 10007-1866
Telephone: (212) 637-4248
Fax: (212) 637-4284
e-mail: rodrigues.isabel@epa.gov

INFORMATION REPOSITORIES

Copies of the Proposed Plan and supporting documentation are available at the following information repositories:

Seymour Public Library
Auburn, New York
Telephone: (315) 252-2571
Hours of operation:
Mon.-Wed. - 10 AM to 9 PM
Thurs., Fri. - 10 AM to 6 PM
Sat. - 10 AM to 4 PM
Electronic copies should also be available – the county is willing to post the information on their website. Please be sure they receive final copies of the documents referenced.

USEPA – Region II
Superfund Records Center
290 Broadway, 18th Floor
New York, New York 10007-1866

SCOPE AND ROLE OF ACTION

The primary objectives of this action are to remediate the groundwater contamination, to minimize the migration of contaminants, and to minimize any potential future health and environmental impacts. This Proposed Plan addresses groundwater contamination at the Site. EPA has designated this action as the first and final operable unit for site remediation.

The source area at the former Powerex facility in the City of Auburn is being addressed under the NYSDEC Superfund program. The effectiveness of the remedy in this Proposed Plan requires coordination between actions to address contaminant sources at the site and the proposed remedy. EPA is coordinating with NYSDEC on the source area investigation and the remedy described in this proposed plan.

The proposed alternative would occur in conjunction with either a State-lead remedial program designed to control the VOC sources at the GE Auburn / Powerex site, or a separate Non Time Critical Removal Action (NTCRA) will be implemented to control the upgradient VOC sources in the vicinity of the GE Auburn / Powerex site.

Remedial actions for the source area is not the focus of this decision document, although successful completion (*i.e.*, reduction of VOC input into the aquifer system from the GE Auburn / Powerex site) of the expected source area work near the GE Auburn / Powerex site is necessary to the full realization of the benefits of the remedial alternatives evaluated in this proposed plan.

SITE BACKGROUND

Site Description

The Site consists of the area within and around a groundwater plume located in Cayuga County, New York. Groundwater contaminated with volatile organic compounds (VOCs) extends from the City of Auburn to the Village of Union Springs, a distance of approximately 7 miles, and includes the townships of Aurelius, Fleming, and Springport. Cayuga County, which is located in the west central part of New York State, is an area referred to as the Finger Lakes Region. A Site location map is provided as Figure 1.

The area consists of residential properties intermingled with extensive farmland and patches of woodlands. Three public water supply systems serve residences at the Site. The Village of Union Springs, on the east shore of Cayuga Lake, operates two water supply wells. Groundwater from these two wells is treated using an air stripper to remove VOCs. The Cayuga County Water and Sewer Authority provides potable water to residents in the Pinckney Road area, and the Town of Springport provides potable water to residences further to the south. The City of Auburn provides water to the Cayuga County Water and Sewer Authority which, in turn, provides a portion of this water to the Town of Springport. The City of Auburn draws water from Owasco Lake, which has not been impacted by the Site. There are currently no restrictions on the use of private wells for potable water or agricultural use in the area.

Site History

Consider the following text for the Site History.

In 1988, routine testing of the Village of Union Springs' municipal drinking water supply, conducted by the NYSDOH, revealed low levels of cis-1,2-dichloroethene (cis-1,2-DCE) and trichloroethene (TCE). In 1989, routine testing of Union Springs Academy's drinking water supply, conducted by the NYSDOH, also revealed low levels of cis-1,2-dichloroethene (cis-1,2-DCE) and trichloroethene (TCE). In 2000, the NYSDEC conducted a potential VOC source area investigation, which

Comment [NYS2]: This is the same approach used for GE plant site source in relation to the Hudson River NPL site. This gives added strength to the State's ongoing enforcement order.

included residential water supplies. As a result of this investigation, 18 residential wells were found to be contaminated with VOCs. Distribution of the contamination indicated that the source(s) were located to the northeast, toward the City of Auburn. In 2001, the Village of Union Springs installed an air stripper on their public water supply to remove the VOC contaminants. The Union Springs Academy well is no longer in service, and the water supply to the school is now provided by the Village of Union Springs public water supply.

In December 2000 and July 2001, EPA conducted a response action that included additional groundwater sampling and the installation of point-of-entry treatment systems on private wells with contaminant levels above the Federal Maximum Contaminant Levels (MCLs). By April 2001, over 300 residential and private water supply wells were sampled in connection with the investigation by EPA, NYSDEC, NYSDOH, and CCHD. As a result of these sampling events, EPA determined that 51 residential wells and three farm wells were contaminated with VOCs, primarily TCE, cis-1,2-DCE, and vinyl chloride (VC), in concentrations above the Federal MCLs. Other residences were found with VOC contaminants but at levels less than the Federal MCLs.

During the fall of 2001, the Cayuga County Water & Sewer Authority installed public water lines to reach almost all homes in the affected area within the Town of Aurelius. In 2006, the Towns of Springport & Fleming installed public water lines to the remainder of the affected area in their Towns . Residences that had point-of-entry treatment systems previously installed by the EPA have been connected to the public water supply. EPA continues to maintain treatment systems on four impacted wells: three dual-use (agricultural/residential) wells, and one residential well. There are a limited number of residences with VOC contamination levels less that the Federal MCL that have point-of-entry treatment units that were installed by Cayuga County with funding from New York State. These units are maintained by the homeowner. There are also a limited number of residences with VOC contamination levels less that the Federal MCLs that have no treatment.

In 1995, routine testing of the Village of Union Springs' municipal drinking water supply, conducted by New York State Department of Health (NYSDOH), revealed low levels of cis-1,2-dichloroethene (cis-1,2-DCE) and other VOCs. In 1999, the NYSDEC conducted a potential VOC source area investigation, which included residential and private water supply wells. As a result of this investigation, 18 residential wells and the well at the Union Springs Academy were found to be contaminated with VOCs. Distribution of the contamination indicated that the source(s) were located to the northeast, toward the City of Auburn. The Union Springs Academy well is no longer in service, and the water supply to the school and the impacted residences is provided by the Village of Union Springs.

In December 2000 and July 2001, EPA conducted a response action that included additional groundwater sampling and the installation of point-of-entry treatment systems on impacted private wells. By April 2001, over 300 residential and private water supply wells were sampled in connection with investigations conducted by EPA, NYSDEC, and NYSDOH. As a result of these sampling events, EPA determined that 51 residential wells and three farm wells were contaminated with VOCs, primarily trichloroethene (TCE), cis-1,2-DCE, and vinyl chloride (VC) in concentrations above the Federal Maximum Contaminant Levels (MCLs). During the fall of 2001, the Cayuga County Water and Sewer Authority undertook an expansion of the public water supply that provides water to residences. These residences had point-of-entry treatment systems installed previously and have been connected to the public water supply. EPA continues to maintain treatment systems on four impacted wells: three dual-use (agricultural/residential) wells, and one residential well.

From January 2001 through the present, several hydrological investigations and groundwater sampling events have been conducted by EPA, NYSDEC and NYSDOH, United States Geological Survey (USGS), and the Cayuga County Department of Health (CCDOH). These investigations involved the installation, hydraulic and geophysical testing, and sampling of groundwater monitoring wells and private residential wells. The results of these investigations indicated that the former Powerex facility, located north of West Genesee Street in the City of Auburn, is a primary source of the groundwater contamination.

On September 13, 2001, EPA proposed inclusion of the Site on the National Priorities List (NPL) and on September 5, 2002, EPA placed the Site on the NPL.

Site Hydrogeology and Conceptual Model

Groundwater investigations at the Site have documented the presence of four hydrogeologic units consisting of the overburden, shallow bedrock (identified as units S1 through S3), intermediate bedrock (identified as units I1 and I2), and deep bedrock (identified as units D1 through D6). The conceptual model regarding groundwater

Comment [NYS4]: If below standards, say so. If above standards, recommend leaving it as is.

Comment [NYS5]: Additional information should be provided here regarding the POET systems that were installed by the county/ state.

Comment [NYS3]: Recommend expanding a little bit on this; indicate whether the values were above or below drinking water standard.

contamination at the Site indicates that contaminants entered the overburden at the Powerex facility, moved downward from the shallow zone, through the intermediate zone via vertical fractures or karst features and into the deep zone, and then moved laterally off the facility and downgradient via groundwater flow, primarily in the D3 unit. This unit is approximately 15 to 20 feet thick and is highly transmissive due to the development of karst solutions features.

The overburden hydrogeologic unit consists of glaciolacustrine deposits of clay, silt, fine sand, and glacial till. Where present, groundwater in the overburden flows towards local surface water bodies or provides recharge to underlying bedrock units. The shallow bedrock hydrogeologic units are composed of the Upper Onondaga/Marcellus Formation (S1), the Middle Onondaga (S2), and the Lower Onondaga (S3). The Marcellus is present in the southern area of the Site and is typically 50 feet thick. The nominal thickness of the Onondaga formation at the Site is 75 feet. Data collected in the shallow bedrock shows that groundwater flow is, generally, northward from Pinckney Road toward Crane Brook and the Owasco Outlet where the shallow groundwater system discharges. The shallow zones can become de-watered locally, suggesting that vertical fracturing extends through the underlying intermediate zone, allowing water to drain into the deep zone. Near Overbrook Drive and Pinckney Road, the water levels from open hole residential wells, suggest that vertical fractures extend through the shallow and intermediate zones.

The intermediate bedrock zone consists of the Manlius Formation, which is typically divided into Upper Manlius (I1) and Lower Manlius (I2). At the Site, the Manlius often functions as an aquitard separating the shallow and deep aquifer units, unless it has been breached by vertical fractures. The nominal thickness of the Manlius formation at the Site is 36 feet.

The deep bedrock is divided into six zones. The Rondout comprises the D1 unit. The Cobleskill comprises the D2 unit. The Bertie formation is divided into three units: the D3 zone, which encompasses the gypsiferous unit at the top of the Forge Hollow Member, the D4 unit, which is the middle of the Bertie Formation, and the D5 unit at the bottom of the Bertie Formation. The D6 unit is the Camillus Shale, which is the base unit in the hydrostratigraphic system investigated in the RI. The deep bedrock aquifer receives groundwater recharge through fractures or karst features connecting the deep and shallow bedrock units. As a result, water levels in the deep bedrock can rise rapidly in response to precipitation events. The rapid rise in hydraulic head in the D3 zone can cause upward flow along vertical fractures, faults, and/or dissolutions voids, resulting in vertical mixing of the deep and intermediate zones. The combined nominal thickness of the five deep bedrock zones above the Camillus at the Site is about 200 feet.

RESULTS OF THE REMEDIAL INVESTIGATION

The results of the RI indicate that groundwater south of Pinckney Road is contaminated in the deep bedrock units (D1 through D6 zones) with chlorinated volatile organic compound (CVOC) contamination, primarily cis-1,2-DCE, TCE, trans-1,2-DCE and VC.

Groundwater

A total of 23 multiport groundwater monitoring wells were installed by EPA at the Site as part of the RI. In addition, as part of the investigation of the Powerex facility, General Electric, Inc. (GE) installed 32 individual screened monitoring wells in the area south of Genesee Street. GE has been identified as a potentially responsible party at the Site. Comprehensive groundwater sampling events were conducted by EPA using all available EPA wells in July 2006, July 2007, and June 2010. The June 2010 sampling event included groundwater samples from the GE wells. During the course of the RI, a total of 603 groundwater samples were collected from the 23 EPA monitoring wells, a total of 82 samples were collected from wells installed by GE, and 12 samples were collected from residential wells. Analytical results for these samples were compared to the EPA and NYSDOH promulgated health-based protective MCLs, which are enforceable standards for various drinking water contaminants.

Groundwater contamination exceeding applicable drinking water standards has been shown to exist within the Site, at highly elevated concentrations in some areas. CVOCs, primarily cis-1,2-DCE, TCE, trans-1,2-DCE and VC, were identified as the site-related contaminants of concern for the deep bedrock units (D1 through D6 zones). Specifically, cis-1,2-DCE was detected at levels up to 89,200 micrograms per liter (µg/l) and vinyl chloride at concentrations up to 5,500 µg/l.

The results of the RI indicate that the potential for natural attenuation of chlorinated compounds varies across the Site. Groundwater contamination occurs primarily in deep zones of the bedrock aquifer system, which have a greater ability to transmit water. Groundwater contamination with VOCs extends from wells on the former Powerex facility south to Pinckney Road and then southwest to the Village of Union Springs, a distance of approximately seven miles. The

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Comment [NYS6]: Include the range of detections observed in private wells.

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highest concentrations of VOCs were consistently detected in monitoring wells located directly south of West Genessee Street and the former Powerex facility.

In the area between West Genesee Street and Pinckney Road, VOC contamination occurs in a relatively narrow area. The contaminant distribution observed in these wells is consistent with groundwater flow to the southwest in the deep bedrock. Historically, groundwater samples collected from monitoring wells near the former Powerex facility consistently had high VOC concentrations. Further south of the former Powerex facility, along Pinckney Road, the VOC plume appears to widen, extending to the east and west along Pinckney Road and Overbrook Drive. In the Pinckney Road area, faulting has caused extensive fracturing of the bedrock. The extensive fracturing provides a pathway for groundwater to flow between the shallow and deep bedrock zones.

South of Pinckney Road, groundwater flow in the deep bedrock is toward the southwest toward Cayuga Lake which is the low point in the regional groundwater flow system. VOCs detected in wells in this area occur in the deep bedrock units. The overall distribution of VOCs in the southern area is consistent with groundwater flow to the southwest. VOC sample results from groundwater discharge areas (springs) indicates that groundwater contamination with VOCs extends to the Village of Union Springs.

Very little contamination was identified in shallow groundwater outside the former Powerex facility. The shallow and intermediate bedrock units appear less transmissive than the D3 unit, and wells set in shallow units south of the former Powerex facility frequently have dry intervals.

Surface Water, Soils, and Sediments

The RI included sampling of surface water from Owasco Outlet, Crane Brook, and Union Springs. Sediment samples were collected from springs, seeps, and streams in the Village of Union Springs. Concentrations of cis-1,2-DCE were detected at concentrations exceeding its site-specific surface water screening criterion in a spring and associated stream in the Village of Union Springs. VOCs detected in the surface water samples were similar to the VOCs that exceeded site-specific screening criteria in groundwater samples. The VOCs observed in the springs and stream in Village of Union Springs suggest discharge of contaminated groundwater to the surface water bodies. No VOCs were detected in the surface water samples collected from Crane Brook and Owasco Outlet at the northern end of the Site.

Vapor Intrusion

EPA investigated the soil vapor intrusion pathway at the Site. VOC vapors released from contaminated groundwater and/or soil have the potential to move through the soil and seep through cracks in basements, foundations, sewer lines, and other openings and affect the indoor air quality of overlying buildings.

EPA conducted vapor intrusion sampling at 54 residences and one school at the Site. EPA drilled through the basement floors and installed ports in order to sample the soil vapor (air) under these residences. Sampling devices called Summa canisters were attached to these ports to collect air from below building slabs at a slow flow rate over a 24 hour period. Summa canisters were also used to collect outdoor air samples to determine if there were any outdoor sources that may impact indoor air quality. The Summa canisters were then collected and sent to a laboratory for analyses.

The results of the analyses indicated that no residences had concentrations of VOCs at or above EPA Region 2 screening levels in sub-slab and indoor air.

Source Investigation

Based on the hydrostratigraphic data, groundwater flow data, contaminant distribution data collected during the RI, and previous investigations, the former Powerex facility is a primary source of the VOC contamination observed in groundwater at the Site. No other sources of VOCs were identified during the RI.

The former Powerex facility consists of 55.4 acres of land located on West Genesee Street on the boundary of the Town of Aurelius and the City of Auburn in Cayuga County, New York. GE purchased the property in 1951 and constructed a manufacturing plant where electric components, including radar equipment, printed circuit boards, and high-voltage semi-conductors were manufactured. The property was acquired by Powerex in January 1986. Powerex continued to manufacture high voltage semi-conductors until May 1990, when the plant was closed. No manufacturing operations are currently conducted at the Site.

On March 31, 1993, NYSDEC and GE entered into an Order on Consent to perform an RI/FS for the former Powerex facility. The RI/FS is currently in progress. Three Interim Remedial Measures (IRMs) have also been performed under the Order on Consent. The first IRM, conducted in February 1994, included the excavation and removal of two laboratory waste solvent tanks and their

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Comment [NYS9]: Include that the municipal wells are contaminated here.

contents. The second IRM involved the installation of additional fencing and gates to restrict access at the Site. This work was completed in December 1994. The third IRM focused on addressing surface water and groundwater in the shallow bedrock source areas, including pre-design investigation activities and a pilot test for the use of dual-phase extraction technology. Pursuant to an Interim Action ROD issued by NYSDEC in March 1996 and an Amended Order on Consent executed on May 12, 1997, GE constructed the groundwater extraction and treatment system. Operation of that system commenced on May 15, 2001. The system consists of 12 extraction wells in and near the source areas and one off-site extraction well.

RISK SUMMARY

As part of the RI, EPA conducted a baseline risk assessment to estimate the current and future effects of contaminants on human health and the environment. A baseline risk assessment is an analysis of the potential adverse human health and ecological effects of releases of hazardous substances from a site in the absence of any actions or controls to mitigate such releases under current and future land, groundwater, surface water, and sediment uses. The baseline risk assessment includes a Human-Health Risk Assessment (HHRA) and an ecological risk assessment.

The cancer risk and non-cancer health hazard estimates in the HHRA are based on current reasonable maximum exposure scenarios and were developed by taking into account various health-protective estimates about the frequency and duration of an individual's exposure to chemicals selected as chemicals of potential concern (COPCs), as well as the toxicity of the contaminants. Cancer risks and non-cancer health hazard indexes (HIs) are summarized below. Please see the text box on page 6 for an explanation of these terms.

The Site is currently a residential neighborhood intermingled with extensive farmland and parcels of woodlands. Future land use is expected to remain the same. In the surrounding area, private and public supply wells meet domestic and agricultural water supply needs and septic systems are used for sanitary disposal. In 2001, the Auburn public water supply system was extended to the Towns of Aurelius, Fleming, and Springport.

The baseline risk assessment began by selecting COPCs in the various media that would be representative of Site risks. The media evaluated as part of the HHRA included groundwater, surface water and sediment. Groundwater at the Site is designated by NYSDEC as a potable water supply. The chemicals of concern for the Site are cis-1,2-DCE, trans-1,2-DCE, TCE, and VC for groundwater pathways.

The baseline risk assessment evaluated health effects that could result from exposure to contaminated media though use of groundwater for potable purposes, including inhalation of vapors in the bathroom after showering, direct exposure to groundwater in an excavation trench, wading in Site waterways, and inhalation of vapors from surface soils. Based on the current zoning and anticipated future use, the risk assessment focused on a variety of possible receptors, including current and future recreational users, future residents, future commercial workers and future construction workers. However, consistent with the anticipated future use of the Site, the receptors most likely to be in contact with media impacted by site-related contamination [e.g., groundwater] were primarily considered when weighing possible remedies for the Site. Current residents were not included because mitigation has been offered (in the form of either treatment or public water supply) to residents whose drinking water wells are contaminated.

Comment [NYS10]: Include some discussion of the performance of the system (IRMS) here as well.

Potential receptors include the future residents, future commercial workers, and future construction workers. A complete discussion of the exposure pathways and estimates of risk can be found in the *Human Health Risk Assessment* for the Site in the information repository.

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A screening-level ecological risk assessment (SLERA) was conducted to evaluate the potential for ecological effects from exposure to surface water and sediment. Surface water and sediment concentrations were compared to ecological screening values as an indicator of the potential for adverse effects to ecological receptors. A complete summary of the methodology utilized can be found in the *Screening Level Ecological Risk Assessment* for the Site in the information repository.

The results of the RI indicated that sediments were not contaminated with site-related contaminants. Therefore, no risks were calculated for exposure to Site sediments. Exposure to surface waters did not pose an unacceptable cancer risk or non-cancer hazard.

A vapor intrusion screening evaluation indicated that there was a potential for VOCs in groundwater to migrate into buildings in the areas along and south of West Genessee Street, in the vicinity of Pinckney Road, and at potential groundwater discharge areas in Union Springs. In 2009, EPA conducted an investigation of vapor intrusion into structures within the area by collecting subslab and indoor air data. EPA evaluated the vapor

WHAT IS RISK AND HOW IS IT CALCULATED?

Human Health Risk Assessment: A Superfund baseline human health risk assessment is an analysis of the potential adverse health effects caused by hazardous substance releases from a site in the absence of any actions to control or mitigate these under current- and future-land uses. A four-step process is utilized for assessing site-related human health risks for reasonable maximum exposure scenarios.

Hazard Identification: In this step, the chemicals of potential concern (COPCs) at the site in various media (*i.e.*, soil, groundwater, surface water, and air) are identified based on such factors as toxicity, frequency of occurrence, and fate and transport of the contaminants in the environment, concentrations of the contaminants in specific media, mobility, persistence, and bioaccumulation.

Exposure Assessment: In this step, the different exposure pathways through which people might be exposed to the contaminants in air, water, soil, etc. identified in the previous step are evaluated. Examples of exposure pathways include incidental ingestion of and dermal contact with contaminated soil and ingestion of and dermal contact with contaminated groundwater. Factors relating to the exposure assessment include, but are not limited to, the concentrations in specific media that people might be exposed to and the frequency and duration of that exposure. Using these factors, a "reasonable maximum exposure" scenario, which portrays the highest level of human exposure that could reasonably be expected to occur, is calculated.

Toxicity Assessment: In this step, the types of adverse health effects associated with chemical exposures, and the relationship between magnitude of exposure and severity of adverse effects are determined. Potential health effects are chemical-specific and may include the risk of developing cancer over a lifetime or other non-cancer health hazards, such as changes in the normal functions of organs within the body (*e.g.*, changes in the effectiveness of the immune system). Some chemicals are capable of causing both cancer and non-cancer health hazards.

Risk Characterization: This step summarizes and combines outputs of the exposure and toxicity assessments to provide a quantitative assessment of site risks for all COPCs. Exposures are evaluated based on the potential risk of developing cancer and the potential for non-cancer health hazards. The likelihood of an individual developing cancer is expressed as a probability. For example, a 10^{-4} cancer risk means a "one-in-ten-thousand excess cancer risk"; or one additional cancer may be seen in a population of 10,000 people as a result of exposure to site contaminants under the conditions identified in the Exposure Assessment. Current Superfund regulations for exposures identify the range for determining whether remedial action is necessary as an individual excess lifetime cancer risk of 10^{-4} to 10^{-6}, corresponding to a one-in-ten-thousand to a one-in-a-million excess cancer risk. For non-cancer health effects, a "hazard index" (HI) is calculated. The key concept for a non-cancer HI is that a "threshold" (measured as an HI of less than or equal to 1) exists below which non-cancer health hazards are not expected to occur. The goal of protection is 10^{-6} for cancer risk and an HI of 1 for a non-cancer health hazard. Chemicals that exceed a 10^{-4} cancer risk or an HI of 1 are typically those that will require remedial action at the site and are referred to as Chemicals of Concern or COCs in the final remedial decision or Record of Decision.

intrusion data collected in 2009 and determined that there was no unacceptable risk from vapor intrusion into homes that were tested. EPA determined that additional vapor intrusion investigations were not necessary as there was no risk in the homes that were tested.

Human Health Risk Assessment

EPA's statistical analysis of groundwater sampling data found that the average concentration of cis-1,2-DCE, trans-1,2-DCE, TCE, and VC in the groundwater were 1,459 μg/l, 26 ug, 11 μg/l, and 71 μg/l, respectively. All are in excess of EPA's Safe Drinking Water Act MCLs of 70 μg/l, 70 ug, 5 μg/l, and 2 μg/l, respectively. These concentrations also exceed the NYSDOH MCLs, which are 5 μg/l for cis-1,2-DCE, trans-1,2-DCE, and TCE, and 2 μg/l for VC. These concentrations are associated with an excess lifetime cancer risk of 2 x 10^{-4} for the future site worker, 5 x 10^{-4} for the future adult resident, and 4 x 10^{-3} for the future child resident. The calculated non-carcinogenic hazard quotients (HQs) are: future site worker HQ=7, future adult resident HQ=21, and future child resident HQ=51.

These cancer risks and non-cancer health hazards indicate that there is significant potential risk to potentially exposed populations from direct exposure to groundwater. For these receptors, exposure to groundwater results in either an excess lifetime cancer risk that exceeds EPA's target risk range of 10^{-4} and 10^{-6} or an HI above the acceptable level of 1, or both. The chemical in groundwater that contribute most significantly to the cancer risk and non-cancer hazard is VC.

Ecological Risk Assessment

The SLERA focused on identifying potential environmental risks associated with aquatic environments present at the Site. The SLERA focused on impacts of contaminants in surface water and sediment from three water bodies: Owasco Outlet, Crane Brook, and ponds and streams in Union Springs.

The primary risk scenarios for aquatic organisms considered were from direct contact with, and ingestion of, contaminated surface water, sediment, and/or sediment pore water. A comparison of maximum concentrations of contaminants detected in site surface water and sediment to conservatively derived published ecological screening levels (ESLs) indicate no risks to ecological receptors. Thus, no COPCs were identified in surface water or sediment. Consequently, the potential risk for ecological receptors was considered insignificant.

Based on the results of the SLERA, concentrations of contaminants detected in surface water and sediment at the Site are unlikely to pose any unacceptable risks to aquatic or terrestrial ecological receptors at the Site.

Summary of Human Health and Ecological Risks

The results of the HHRA indicate that the contaminated groundwater presents an unacceptable exposure risk. The SLERA indicated that the Site does not pose any unacceptable risks to aquatic or terrestrial ecological receptors.

Based upon the results of the RI and the risk assessment, EPA has determined that actual or threatened releases of hazardous substances from the Site, if not addressed by the preferred remedy or one of the other active measures considered, may present a current or potential threat to human health and the environment. It is the EPA's current judgment that the Preferred Alternative identified in the Proposed Plan is necessary to protect public health or welfare or the environment from actual or threatened releases of hazardous substances into the environment.

REMEDIAL ACTION OBJECTIVES

Remedial action objectives (RAOs) are specific goals to protect human health and the environment. These objectives are based on available information and standards, such as applicable or relevant and appropriate requirements (ARARs), to-be-considered guidance, and site-specific risk-based levels.
The following RAOs for contaminated groundwater will address the human health risks and environmental concerns:

- Protect human health from exposure (via ingestion and dermal contact) to VOCs in groundwater at concentrations in excess of federal and State MCLs;
- Restore the impacted aquifer to beneficial use as a source of drinking water by reducing contaminant levels to the federal and State MCLs and the State's promulgated groundwater standards; and,
- Reduce or eliminate the potential for migration of contaminants towards the Village of Union Springs public water supply wells.

SUMMARY OF REMEDIAL ALTERNATIVES

CERCLA §121(b)(1), 42 U.S.C. §9621(b)(1), mandates that remedial actions must be protective of human health and the environment, cost-effective, comply with ARARS, and utilize permanent solutions and alternative treatment technologies and resource recovery alternatives to the maximum extent practicable. Section 121(b)(1) also establishes a preference for remedial actions which employ, as a principal element, treatment to permanently and significantly reduce the volume, toxicity, or mobility of the hazardous substances, pollutants and contaminants at a site. CERCLA §121(d), 42 U.S.C. §9621(d), further specifies that a remedial action must attain a level or standard of control of the hazardous substances, pollutants, and contaminants, which at least attains ARARs under federal and state laws, unless a waiver can be justified pursuant to CERCLA §121(d)(4), 42 U.S.C. §9621(d)(4).

Detailed descriptions of the remedial alternatives for addressing the contamination associated with the Site can be found in the FS report. The FS report presents four groundwater alternatives, including a no action alternative.

The construction time for each alternative reflects only the time required to construct or implement the remedy and does not include the time required to design the remedy, negotiate the performance of the remedy with any potentially responsible parties, or procure contracts for design and construction.

Common Elements

All of the alternatives, with the exception of the no action alternative, include common components. Alternatives 2 through 4 require the connection of impacted residences to the public water supply system for their future potable water needs. This action will provide the physical connection from the house to the water main. Currently, EPA maintains a point-of-entry treatment system at one residence. These alternatives also require the treatment of extracted groundwater at impacted agricultural or dairy farms through air stripping or carbon. Existing systems will be maintained, as necessary. Currently, EPA maintains treatments systems at three dairy farms. Each of these alternatives requires the long-term monitoring of the groundwater, long-term monitoring of surface water in Union Springs and institutional controls for groundwater use restrictions. EPA should also include that any new water users in the area impacted by the plume will also be connected to the public water supply, or provided treatment, as part of the proposed remedy.

Remediation Areas

Based on the level of impacts to the groundwater, the Site has been divided into three areas for remediation purposes (refer to Figure 2).

Area 1 consists of the impacted areas south of the former Powerex facility and extends approximately 700 to 900 feet south of West Genesee Street. In Area 1, the maximum detected concentration of cis-1,2-DCE is 89,200 µg/l.

Area 2 consists of the impacted areas south-southwest of Area 1, which extends approximately south of Pinckney

Comment [NYS11]: If public water supply is not available then treatment needs to be available as well. How will this be enforced?

Comment [NYS12]: Additional POET systems were installed by the county/ state due to the difference between the state and federal MCL for cis-DCE. The maintenance of these systems needs to be included in the final remedy.

Comment [NYS13]: Explain what institutional controls are envisioned somewhere in this document.

Comment [NYS14]: Some additional sampling maybe be necessary to ensure that the extent of the plume has been defined.

Road to the southwest and to the Town of Aurelius to the south. In Area 2, concentrations of cis-1,2-DCE in residential wells were generally less than 500 µg/l. The highest concentrations of contaminants detected in Area 2 groundwater are approximately 100 times less than the highest groundwater concentrations detected in Area 1.

Area 3 consists of the impacted areas south of Area 2 extending to Union Springs. Historical concentrations of cis-1,2-DCE in residential wells were generally less than 500 µg/l.

The screening process conducted as part of the FS evaluated a wide range of technologies to remediate the contaminated groundwater at the Site. This process determined that, in addition to no further action for each of the three areas, ground water pump and treat and enhanced in-situ bioremediation would be evaluated to remediate Area 1, enhanced in-situ bioremediation and monitored natural attenuation would be evaluated to address Area 2, and monitored natural attenuation would be evaluated to address Area 3.

Alternative 1: No Action

The NCP requires that a "No Action" alternative be developed as a baseline for comparing other remedial alternatives. Under this alternative, there would be no remedial actions conducted at the Site to control or remove groundwater contaminants. This alternative does not include monitoring or institutional controls. Because this alternative would result in contaminants remaining above levels that allow for unrestricted use and unlimited exposure, CERCLA requires that the Site be reviewed at least once every five years. If justified by the review, additional response actions may be implemented.

Capital Cost:	$0
Annual Operations & Maintenance (O&M) Costs:	$0
Present-Worth Cost:	$0
Construction Time:	Not Applicable

Alternative 2: Groundwater Pump and Treat

This remedial alternative consists of the extraction of groundwater via pumping wells and treatment prior to disposal. Groundwater is pumped to remove contaminant mass from areas of the aquifer with elevated concentrations of contaminants. For this conceptual design, it is estimated that groundwater extraction wells would be installed in the unit D3 of the aquifer. A treatment plant with a capacity of approximately 400 gallons per minute (gpm) would be constructed within or near the Site to achieve the mass removal objectives. Extracted groundwater with VOC contamination would be treated by air stripping. Air stripper effluent may be treated with a thermal oxidizer system prior to being discharged into the atmosphere, if necessary. Due to the variation in hydraulic and hydrogeologic properties, as well as the contaminant concentrations, during the remedial design, pilot studies and performance tests will be conducted to determine the number and location of extraction wells required to ensure that a minimal number of wells are installed and the required mass removal is achieved. During the remedial design, a determination will also be made either to discharge treated extracted groundwater to surface water or to reinject to groundwater.

Capital Cost:	$20.05 Million
Annual O&M Costs:	$2.81 Million
Present-Worth Cost:	$53.8 Million
Construction Time:	24 months

Alternative 3: Enhanced In-Situ Biological and Abiotic Remediation

Enhanced in-situ biological and abiotic remediation involves the injection of an electron donor, nutrients, dechlorinating microorganisms (i.e., bioaugmentation), and/or other chemicals into the groundwater at the impacted depths using an extraction-reinjection well network. Once delivered, these chemicals promote reductive dechlorination, a process used to describe the degradation of CVOCs.

There are several different in-situ treatment process options that are potentially applicable under this alternative, including Enhanced Anaerobic Bioremediation (EAB) and Biogeochemical Transformation. EAB is the process of adding a carbon source as an electron donor, which would promote the biological reductive dechlorination of CVOCs by microorganisms in the subsurface. Lactate, emulsified vegetable oil (EVO), and whey are examples of carbon sources used to promote the biodegradation of chlorinated solvents by naturally occurring microorganisms called, Dehalococcoides. [EPA should also describe which portions of the plume (Area 1, Area 2, and/or Area 3) would be targeted for treatment under this alternative, and which will rely on MNA processes to meet the RAOs. Explain why area 3 is excluded.]

Comment [NYS16]: Include that this would be done in accordance with NYSDEC and/or EPA regulations.

Comment [NYS15]: Maximum concentrations of TCE and VC should also be included here.

Comment [NYS17]: The cost table below indicates that this alternative applies to Area 1 only. This should be noted in the text with an explanation as to why only Area 1 is covered by this Alternative?

Biogeochemical transformation degrades chlorinated solvents though a combination of biological and abiotic (i.e., not dependent on microorganisms) processes. This process involves the addition of a carbon source (such as lactate, EVO, or others) along with sources of iron and/or sulfate to promote both biotic and abiotic reductive dechlorination processes.

The FS evaluated each of these four process options. Further evaluation during the remedial design would be required to determine the specific process option or combination of process options if chosen to be implemented. Pilot studies would be required to assess treatment effectiveness. During the remedial design, further evaluation would be conducted to determine the effective number and location of the injection well network in delivering the agents into the subsurface. It is anticipated that repeated injections may be necessary.

Area 1
Capital Cost: $16.29 Million
Annual O&M Costs: $163,300
Present-Worth Costs: $18.32 Million
Construction Time (excluding pilot study): 24 months

Area 2
Capital Cost: $ 10.4Million
Annual O&M Costs: $163,300
Present-Worth Costs: $ 12.4Million
Construction Time (excluding pilot study): 24 months

The cost information provided above is for the biogeochemical transformation process option. Detailed cost information for each process option is included in the FS.

Alternative 4: Monitored Natural Attenuation (MNA)

This remedial alternative relies on monitored natural attenuation to address the groundwater contamination. Natural attenuation is the process by which contaminant concentrations are reduced by various naturally occurring physical, chemical, and biological processes. The main processes include biodegradation, dispersion, dilution, sorption, volatization, and chemical or biological stabilization, transformation, or destruction of contaminants. These processes occur naturally, in situ, and act to decrease the mass or concentration of contaminants in the subsurface. Only non-augmented natural processes are relied upon under this alternative. Augmentation through addition of electron acceptors or nutrients is considered an in situ technology.

Area 2
Capital Cost: $246,000
Annual O&M Costs: $134,000
Present-Worth Cost: $1.91 Million
Construction Time: 2 months

Area 3
Capital Cost: $772,000
Annual O&M Costs: $275,000
Present-Worth Cost: $4.18 Million
Construction Time: 2 months

EVALUATION OF ALTERNATIVES

During the detailed evaluation of remedial alternatives, each alternative is assessed against nine evaluation criteria, namely overall protection of human health and the environment, compliance with ARARs, long-term effectiveness and permanence, reduction of toxicity, mobility, or volume through treatment, short-term effectiveness, implementability, cost, and state and community acceptance.

Refer to the table on the next page for a description of the evaluation criteria.

This section of the Proposed Plan profiles the relative performance of each alternative against the nine criteria, noting how each compares to the other options under consideration. A detailed analysis of alternatives can be found in the FS Report.

Overall Protection of Human Health and the Environment

Each of the alternatives evaluated for Areas 1, 2, and 3, except Alternative 1: No Action, would provide protection of human health and the environment. Alternatives 2 and 3 are active remedies that address groundwater contamination. Alternative 4 relies on certain natural processes to achieve the cleanup levels. Alternatives 2 and 3 in Area 1, Alternatives 3 and 4 in Area 2, and Alternative 4 in Area 3 would restore groundwater quality over the long term.

Protectiveness under Alternatives 2, 3, and 4 requires a combination of reducing contaminant concentrations in groundwater and limiting exposure to residual contaminants through the implementation institutional controls. Institutional controls would protect human health by restricting the use of, and access to, contaminated groundwater. Alternatives 2, 3, and 4 also require the control of contaminant migration from the Powerex facility.

Comment [NYS18]: Explain why Area 1 is excluded?

Comment [NYS19]: Is providing treatment or public water considered an institutional control? Otherwise engineering controls should be added here.

Protectiveness under Alternative 2 is achieved through reducing contaminant concentrations via extraction and treatment of groundwater. Protectiveness under Alternative 3 is achieved through reducing contaminant concentrations in-situ via the injection of materials to facilitate the degradation of contaminants, and protectiveness under Alternative 4 is achieved through reducing contaminants concentrations via naturally occurring processes.

The long-term monitoring program for groundwater would monitor the migration and fate of the contaminants and ensure that human health is protected. Combined with long-term monitoring and institutional controls, Alternatives 2, 3, and 4 would meet the RAOs. Alternative 1 would not meet the RAOs.

Because Alternative 1: No Action is not protective of human health and environment, it was eliminated from consideration under the remaining evaluation criteria.

Compliance with Applicable or relevant and Appropriate Requirements (ARARs)

EPA and NYSDOH have promulgated health-based protective MCLs (40 CFR Part 141 and 10 NYCRR Chapter 1), which are enforceable standards for various drinking water contaminants (chemical-specific ARARs).

The aquifer is classified as Class GA (6 NYCRR 701.18), meaning that it is designated as a potable water supply. Because area groundwater is a source of drinking water, achieving MCLs in the groundwater is an applicable or relevant and appropriate standard.

In Area 1, pilot studies would be undertaken for Alternative 3 to assess specific remediation timeframes. However, Alternative 3 will potentially reach ARARs sooner than Alternatives 2 and 4. Similarly, in Area 2, Alternative 3 potentially reaches ARARs sooner than Alternative 4. In Area 3, chemical-specific ARARs will be attained through certain natural processes (dilution and dispersion). Due to the uncertainty in the mass diffused in the bedrock matrix, the remediation timeframes are uncertain.

Each of the alternatives would comply with location- and action-specific ARARs.

Long-Term Effectiveness and Permanence

Groundwater extraction and treatment under Alternative 2 is considered an effective technology for treatment of contaminated groundwater, if designed and constructed properly. As discussed previously, the former Powerex facility is a primary source of groundwater contamination. The design of an extraction system to remediate the groundwater contamination in the D3 unit would need to ensure that the potential for increased drawdown of contamination to the deeper bedrock intervals from the source areas is addressed. Enhanced in-situ biological and abiotic remediation under Alternative 3 has been demonstrated to be effective and reliable at numerous sites for groundwater treatment for CVOCs in contaminated areas. At the Powerex facility, a bench scale pilot study was conducted in 2011 that demonstrated the potential effectiveness of the biochemical transformation technology. However, groundwater concentrations may rebound if there is continued migration of CVOCs from source areas. Active remediation may be required over the long-term to address continued migration of contaminants from source areas into groundwater. Some limitations may be encountered with in-situ injections, including implementation issues due to delivery of injected materials into bedrock at depth, and high levels of sulfate in the formation, which could compete with microbial processes that degrade CVOCs.

Indigenous bacteria capable of complete reductive dechlorination of the contaminants may be localized at or immediately downgradient of the former Powerex facility. Dispersion, diffusion, and dilution appear to be the dominant natural attenuation mechanisms identified for this Site.

In each alternative, some residual risk above levels of concern would remain under contaminated groundwater

Comment [NYS20]: We already know that the plant site is a source area which is why this remedy should include the need for the plant site to be cleaned up per the State's order/program.

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EVALUATION CRITERIA FOR SUPERFUND REMEDIAL ALTERNATIVES

Overall Protectiveness of Human Health and the Environment evaluates whether and how an alternative eliminates, reduces, or controls threats to public health and the environment through institutional controls, engineering controls, or treatment.

Compliance with Applicable or Relevant and Appropriate Requirements (ARARs) evaluates whether the alternative meets federal and state environmental statutes, regulations, and other requirements that pertain to the site, or whether a waiver is justified.

Long-term Effectiveness and Permanence considers the ability of an alternative to maintain protection of human health and the environment over time.

Reduction of Toxicity, Mobility, or Volume (TMV) of Contaminants through Treatment evaluates an alternative's use of treatment to reduce the harmful effects of principal contaminants, their ability to move in the environment, and the amount of contamination present.

Short-term Effectiveness considers the length of time needed to implement an alternative and the risks the alternative poses to workers, the community, and the environment during implementation.

Implementability considers the technical and administrative feasibility of implementing the alternative, including factors such as the relative availability of goods and services.

Cost includes estimated capital and annual operations and maintenance costs, as well as present worth cost. Present worth cost is the total cost of an alternative over time in terms of today's dollar value. Cost estimates are expected to be accurate within a range of +50 to -30 percent.

State/Support Agency Acceptance considers whether the State agrees with the EPA's analyses and recommendations, as described in the RI/FS and Proposed Plan.

Community Acceptance considers whether the local community agrees with EPA's analyses and preferred alternative. Comments received on the Proposed Plan are an important indicator of community acceptance.

since these alternatives rely upon institutional controls for protection. Residual risk under Alternative 4 would likely be reduced below levels of concern over a longer-term remedial timeframe, as natural attenuation appears to be limited.

<u>Reduction of Toxicity, Mobility, or Volume Through Treatment</u>

Alternatives 2 and 3 reduce the toxicity and volume of contaminants at the Site through treatment of contaminated groundwater. Alternative 2 removes contaminated groundwater and treats it via air stripping. Alternative 3 uses biological and abiotic processes to degrade contaminants in groundwater to less harmful compounds. Alternative 4 relies on natural processes to degrade contaminants and, hence, the reduction in toxicity, mobility, and volume may vary with location. In Area 1, Alternative 2 would be the most effective at reducing the mobility of the groundwater contamination by extracting the contaminated groundwater. In Area 2, Alternative 3 would be most effective, if it can be implemented <u>since Alternative 4 relies on dispersion and dilution to reduce the toxicity and volume of contaminants.</u> During the EAB (under Alternative 3) and monitored natural attenuation biological degradation processes, TCE and cis-1,2- DCE could be transformed into the more toxic VC under anaerobic conditions in the subsurface prior to degradation to the less toxic ethane. This transformation would need to be monitored and managed to prevent exposure via drinking contaminated water.

Deleted: since Alternative 4 relies on dispersion and dilution to reduce the toxicity and volume of contaminants,

<u>Short-Term Effectiveness</u>

Alternative 2 and 3 may have short-term impacts to remediation workers, the public, and the environment during implementation. The short-term impacts due to Alternative 4 are minimal as it does not involve active remediation. Alternative 2 is expected to have higher short-term impacts compared to Alternative 3. Remedy-related construction (e.g., well installation and trench excavation) under Alternative 2 would require disruptions in traffic. In addition, Alternative 2 has aboveground treatment components and infrastructure that may create a minor noise nuisance and inconvenience for local residents during construction. Exposure of workers, the surrounding community and the local environment to contaminants during implementation of the three alternatives is minimal. No difficulties are foreseen with managing the required quantity of the injection material needed in Alternative 3, as it is non-hazardous. Drilling activities, including the installation of monitoring, injection, and extraction wells for Alternatives 2 and 3 could produce contaminated liquids that present some risk to remediation workers at the Site. The potential for remediation workers to have direct contact with contaminants in groundwater could also occur when groundwater remediation systems are operating under Alternative 2. Alternative 2 could increase the risks of exposure, ingestion, and inhalation of contaminants by workers and the community because contaminated groundwater would be extracted to the surface for treatment. However, measures would be implemented to mitigate exposure risks through the use of personnel protective equipment (PPE) and standard health and safety practices. All three alternatives include monitoring that would provide the data needed for proper management of the remedial processes and measures to address any potential impacts to the community, remediation workers, and the environment. Groundwater monitoring and discharge of treated groundwater will have minimal impact on workers responsible for periodic sampling. The time frame to meet groundwater RAOs in each of the three Areas is difficult to predict, but is expected to exceed 30 years.

Implementability

All technologies under Alternatives 2, 3, and 4 are well-established technologies that have commercially available equipment and are implementable. However, the implementation of Alternatives 2 and 3 may be challenging due to the nature of the subsurface materials and the depths of the contaminants. In Area 1, Alternative 3 would be easier to implement than Alternative 2 since it involves the installation of fewer wells and a lesser amount of long-term operations. Alternative 4 is the easiest alternative to implement since no active remediation would be performed under this alternative. Each of these three alternatives would require routine groundwater quality, performance and administrative monitoring, including five-year CERCLA reviews. Alternatives 2 and 3 require periodic O&M for the life of the treatment.

Cost

The estimated capital cost, O&M and present worth cost are discussed in detail in the FS Report. The cost estimates are based on the best available information. Alternative 1: No Action has no cost because no activities are implemented. The estimated capital, O&M and present worth cost for each of the alternatives are presented below. The highest present worth cost alternative is Alternative 2 in Area 1, at $53.8 million.

Table 1: Summary of Alternatives Cost

Alternative	Capital Cost	Annual O&M Cost	Present Worth
Area 1: Alternative 2	$20.05 M	$2.81 M	$53.8 M
Area 1: Alternative 3	$16.29 M	$163,300	$18.32 M
Area 2: Alternative 3	$10.4 M	$163,300	$12.4 M
Area 2: Alternative 4	246,000	$134,000	$1.91 M
Area 3: Alternative 4	$772,000	$275,000	$4.18 M

State/Support Agency Acceptance

NYSDEC concurs with the preferred alternative.

Community Acceptance

Community acceptance of the Preferred Alternative will be evaluated after the public comment period ends and will be described in the ROD for this Site. The ROD is the document that formalizes the selection of the remedy for a site.

PREFERRED REMEDY

Based upon an evaluation of the remedial alternatives, EPA, in consultation with NYSDEC, recommends Alternative 3: Enhanced In-Situ Biological and Abiotic Remediation for Area 1, and Alternative 4: Monitored Natural Attenuation for Areas 2 and 3, as the Preferred Alternative.

Alternative 3 has the following key components: the in-situ treatment of contaminated water to promote reductive dechlorination of chlorinated solvents in the D3 zone of the Forge Hollow Unit in Area 1 and long-term monitoring, in conjunction with implementation of institutional controls. Under this alternative, both biological and abiotic processes are enabled during the in-situ biogeochemical transformation process to promote reductive dechlorination of chlorinated solvents. This alternative is a flexible approach that could include a combination of one or more process options to produce equivalent or better overall treatment effectiveness. Other potential process options include the addition of a carbon source that enhances the biological reductive dechlorination of the contaminants by the microorganisms in the subsurface. Carbon is delivered with lactate or other injectants, such as EVO or whey. The amendments to be injected, injection dosages, duration of injections, and frequency of supplemental injections will be determined during the remedial design. The extraction and injection well network will be designed with the placement of extraction wells at high yield locations and the injection well locations would likely be biased closer to flow paths. Figure 3 provides the conceptual extraction and injection well locations.

Alternative 4 in Area 2 and Area 3 involves monitoring naturally occurring, in-situ processes, to decrease the mass or concentration of contaminants in groundwater. Under this alternative, additional monitoring wells as shown in Figures 4 and 5 would be installed and included as part of the monitoring well network. The monitoring program would consist of quarterly monitoring for parameters such as VOCs, geochemical indicators and hydrogeologic parameters in the monitoring well network. Additional modeling to evaluate the attenuation processes would be performed and institutional controls would be implemented.

Impacted residences would be connected to the Village of Union Springs or Springport/Fleming Water District, or the Cayuga County Water and Sewer Authority for their future potable water needs. Existing groundwater treatment systems at three dairy farms will be maintained, as necessary, or connected to the public water supply system. Any new water users in the area impacted by the plume will also be connected to the public water supply, or provided treatment, as part of the proposed remedy.

The environmental benefits of the preferred remedy may be enhanced by giving consideration, during the design, to technologies and practices that are sustainable in accordance with EPA Region 2's Clean and Green Energy Policy[1]. This will include consideration of green remediation technologies and practices.

A long-term groundwater and surface water monitoring program would be implemented to track and monitor changes in the groundwater contamination and surface water in Union Springs and ensure the RAOs are attained. The results from the long-term monitoring program will be used to evaluate the migration and changes in the VOC contaminants over time. The long-term monitoring program will be modified accordingly.

While this alternative will ultimately result in reduction of contaminant levels in groundwater to levels that would allow for unlimited use and unrestricted exposure, it will take longer than five years to achieve these levels. As a result, in accordance with EPA policy, the Site is to be reviewed at least once every five years.

The Preferred Alternative includes a contingency remedy. A contingency remedy will be implemented if it is determined that Alternative 3: Enhanced In-Situ Biological and Abiotic Remediation in Area 1 or Alternative 4: Monitored Natural Attenuation in Area 2 is not adequately protective of human health and the environment. The contingency remedy for Area 1 will consist of Alternative 2: Groundwater Pump and Treat and Alternative 3: Enhanced In-Situ Bioremediation for Area 2. There is no contingency remedy for Area 3.

The former Powerex facility continues to be a primary source of VOC contamination to groundwater at this Site. As mentioned previously, the source investigation and response actions for the former Powerex facility are being addressed by NYSDEC and GE. Remedial actions for the former Powerex facility are not the focus of this decision document, although successful completion (i.e. source control or remediation) of the source area(s) at the former Powerex facility is important to the full realization of the benefits of the Preferred Alternative in this Proposed Plan. In the event that source control is not successfully implemented pursuant to New York State law, EPA may elect to evaluate additional options at the former Powerex facility pursuant to CERCLA to ensure the effectiveness of the Preferred Alternative.

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Comment [NYS21]: Would EPA seek to have GE to pay for this?

Basis for the Remedy Preference

While Alternative 2: Groundwater Pump and Treat and Alternative 3: Enhanced In-Situ Biological and Abiotic Remediation both use proven technologies to actively treat VOC contaminated groundwater in Area 1, Alternative 2 would be significantly more expensive to construct and implement than Alternative 3. In Area 2 and Area 3, Alternative 3 would be significantly more expensive to construct and implement than Alternative 4: Monitored Natural Attenuation. Alternative 4 in Area 2 and Area 3 relies on reduced contaminant migration from upgradient areas and natural processes to achieve MCLs in the groundwater.

Although the timeframe to achieve MCLs in the groundwater is uncertain due to the continuing source to groundwater contamination at the former Powerex facility and the impact of the mass diffused in the bedrock matrix, long-term groundwater monitoring would ensure that RAOs are achieved at the Site. There is currently no threat of exposure to contaminated groundwater at the Site since point-of-use treatment systems are maintained on impacted residences and farms that are not connected to the municipal drinking water supply. Therefore, EPA and NYSDEC believe that Alternative 3: Enhanced In-Situ Biological and Abiotic Remediation in Area 1, and Alternative 4: Monitored Natural Attenuation in Areas 2 and 3 would be protective of human health and the environment by effectively reducing the toxicity and volume of contaminated groundwater at the Site, while providing the best balance of tradeoffs among the alternatives with respect to the evaluation criteria.

Comment [NYS22]: A statement regarding the expected duration should be added here.

As noted previously, a separate source control action near the GE Auburn / Powerex site is to be implemented timely by GE, under an administrative order issued by NYSDEC, in order to address the continuing movement of VOCs from that facility. In the event that source control at the GE Auburn / Powerex plant is not successfully implemented pursuant to New York State law, EPA has authorized the performance of an Engineering Evaluation/Cost Analysis to evaluate options for a Non-Time Critical Removal Action at the GE Auburn/ Powerex site pursuant to

CERCLA in order to ensure that the VOC migration from the source areas at the GE Auburn / Powerex plant is sufficiently reduced to allow for the maximum benefits of the EPA proposed remedial alternative. EPA's analyses assume significant reductions in VOC migration from these sources once the State's plans for remediation are implemented.

Addition Comment on Figure 3 – Put boundaries showing the approximate extent of impacts for Area 3.